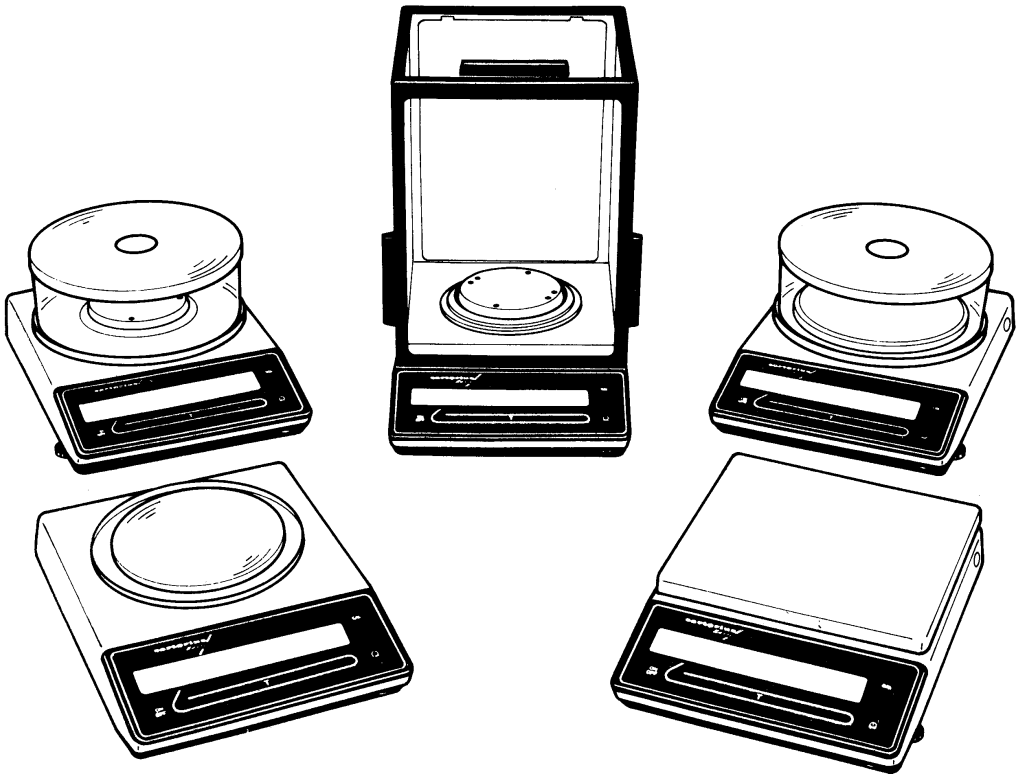
98648-002-63

Sartorius *Basic*

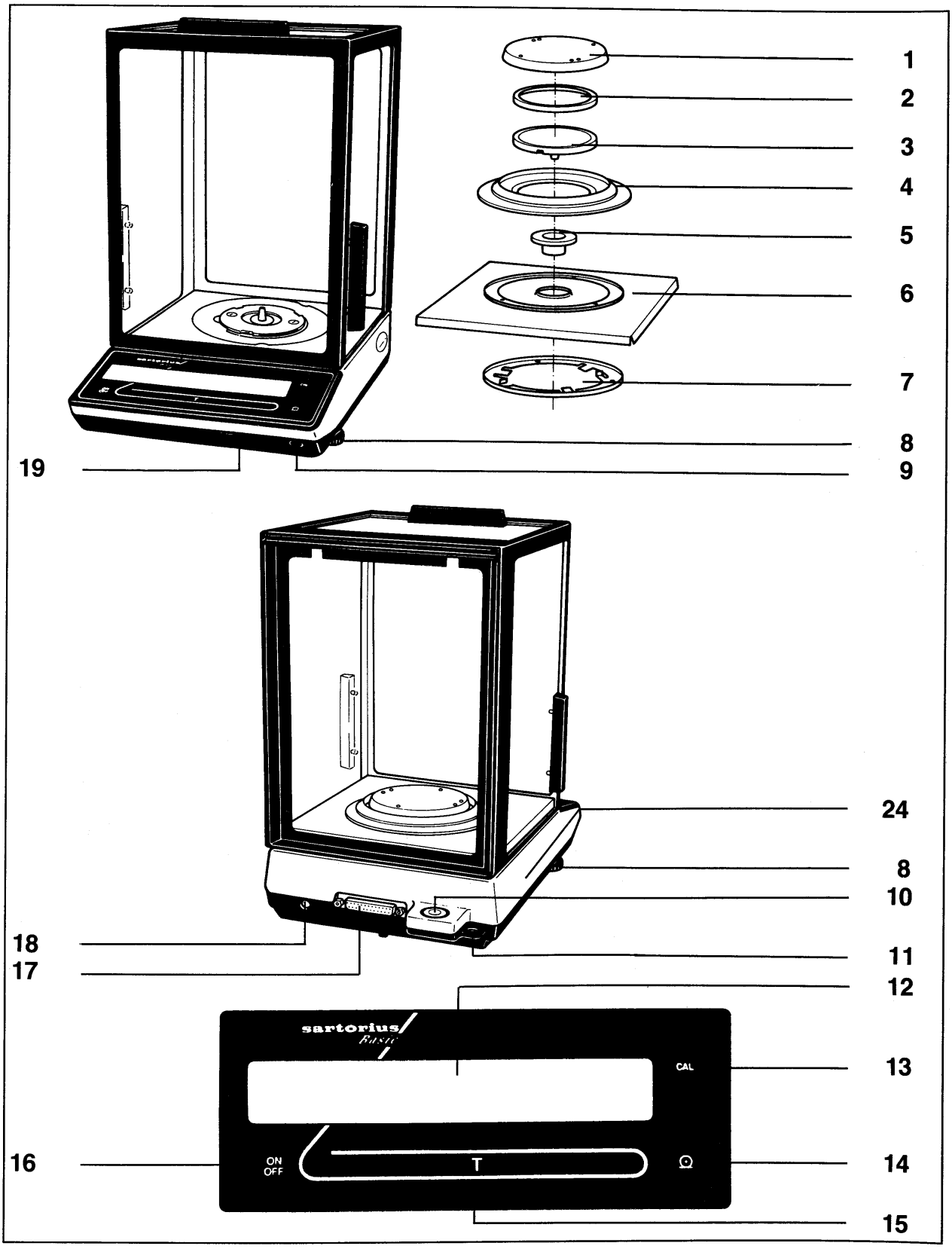
Electronic Analytical and precision Balances



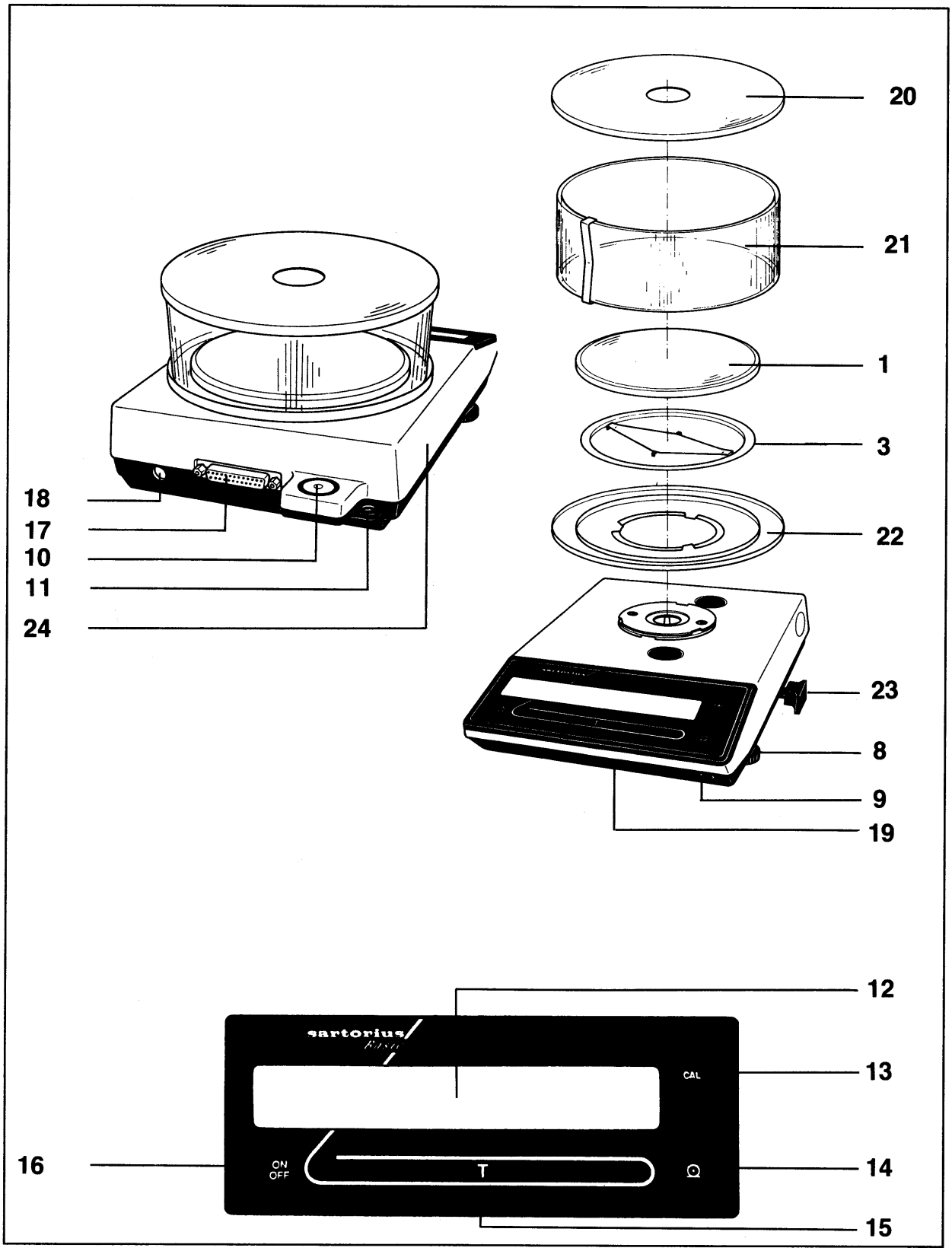
Installation and Operating Instructions

sartorius

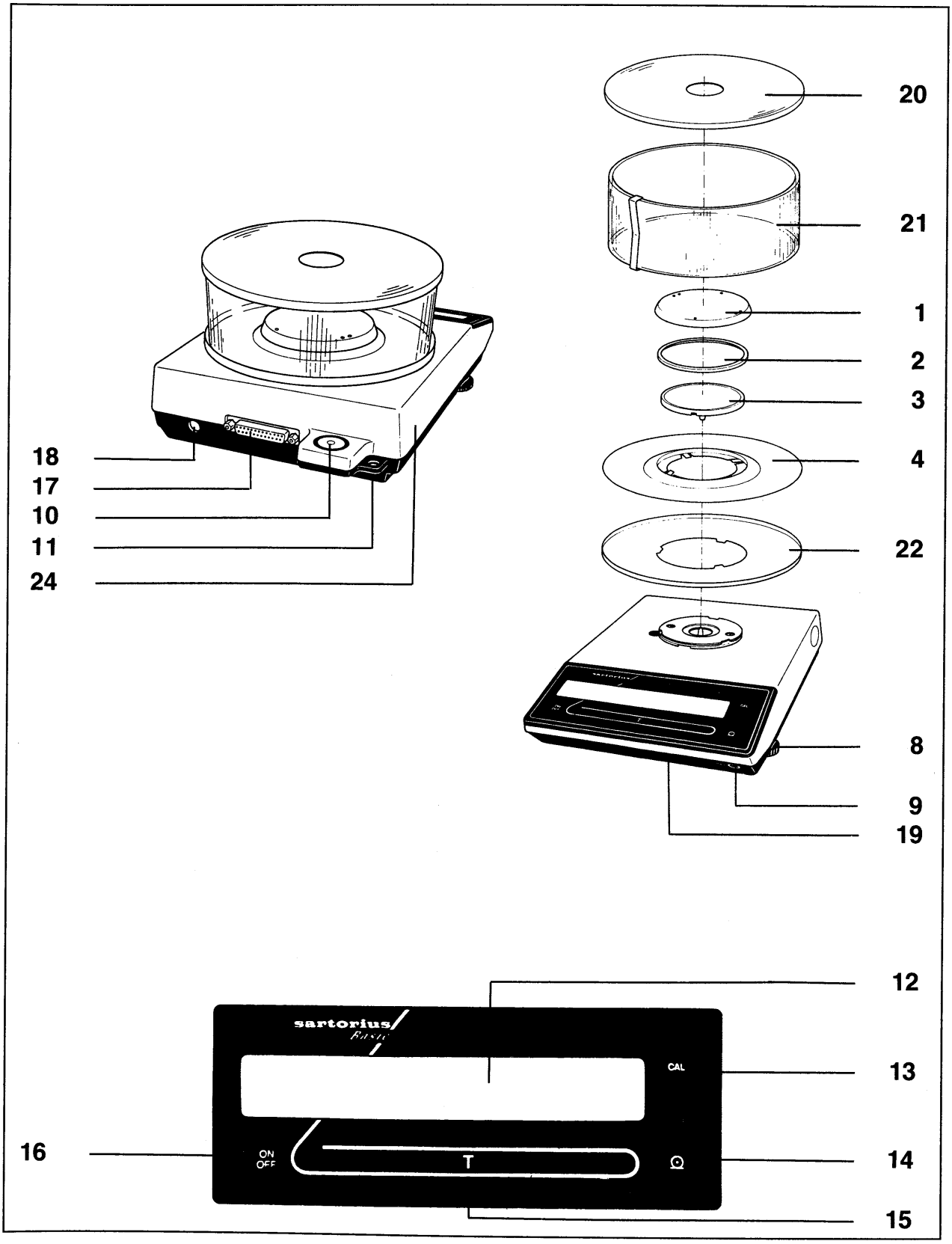
BA 210 S, BA 160 P, BA 110 S



BA 310 S, BA 310 P



BA 110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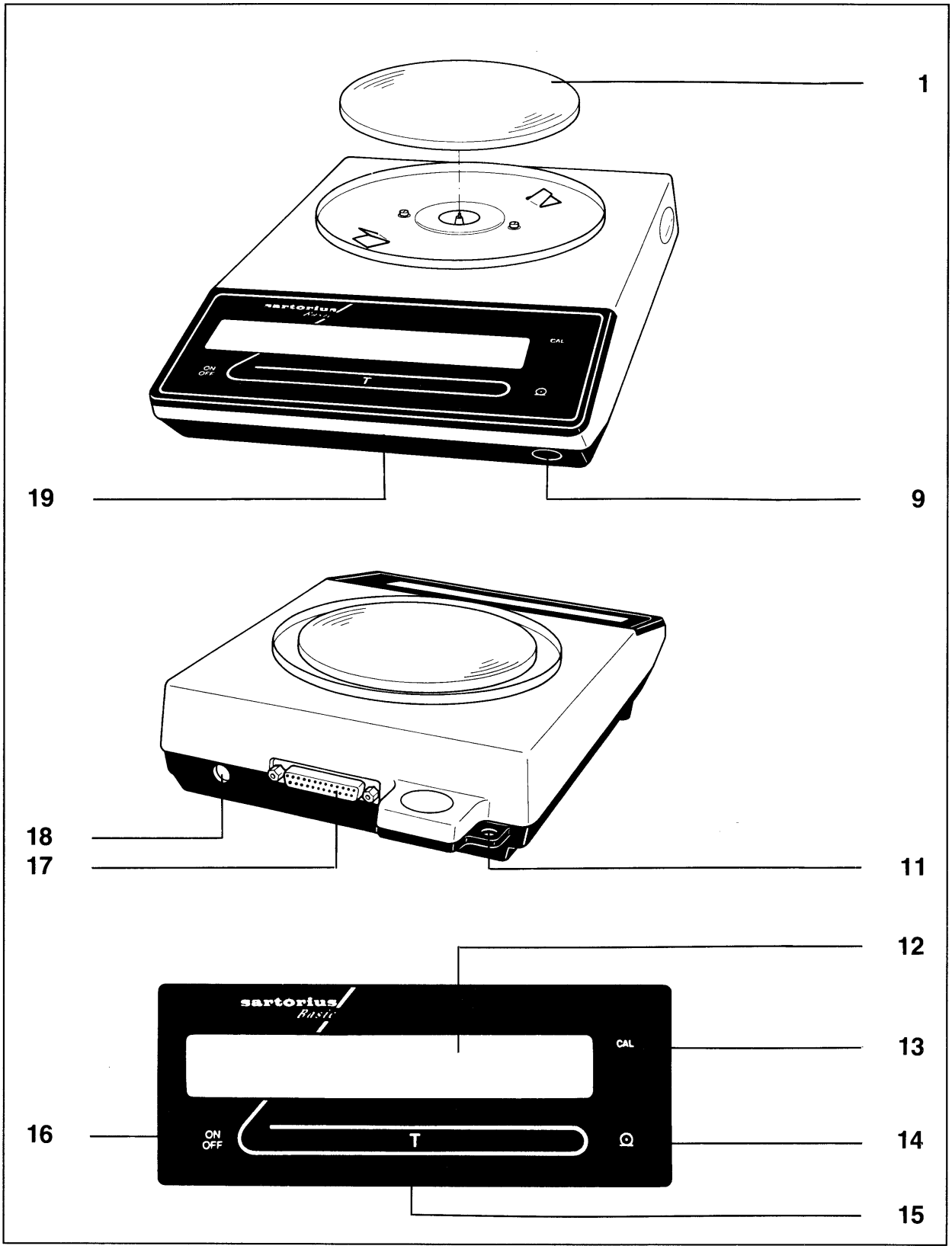
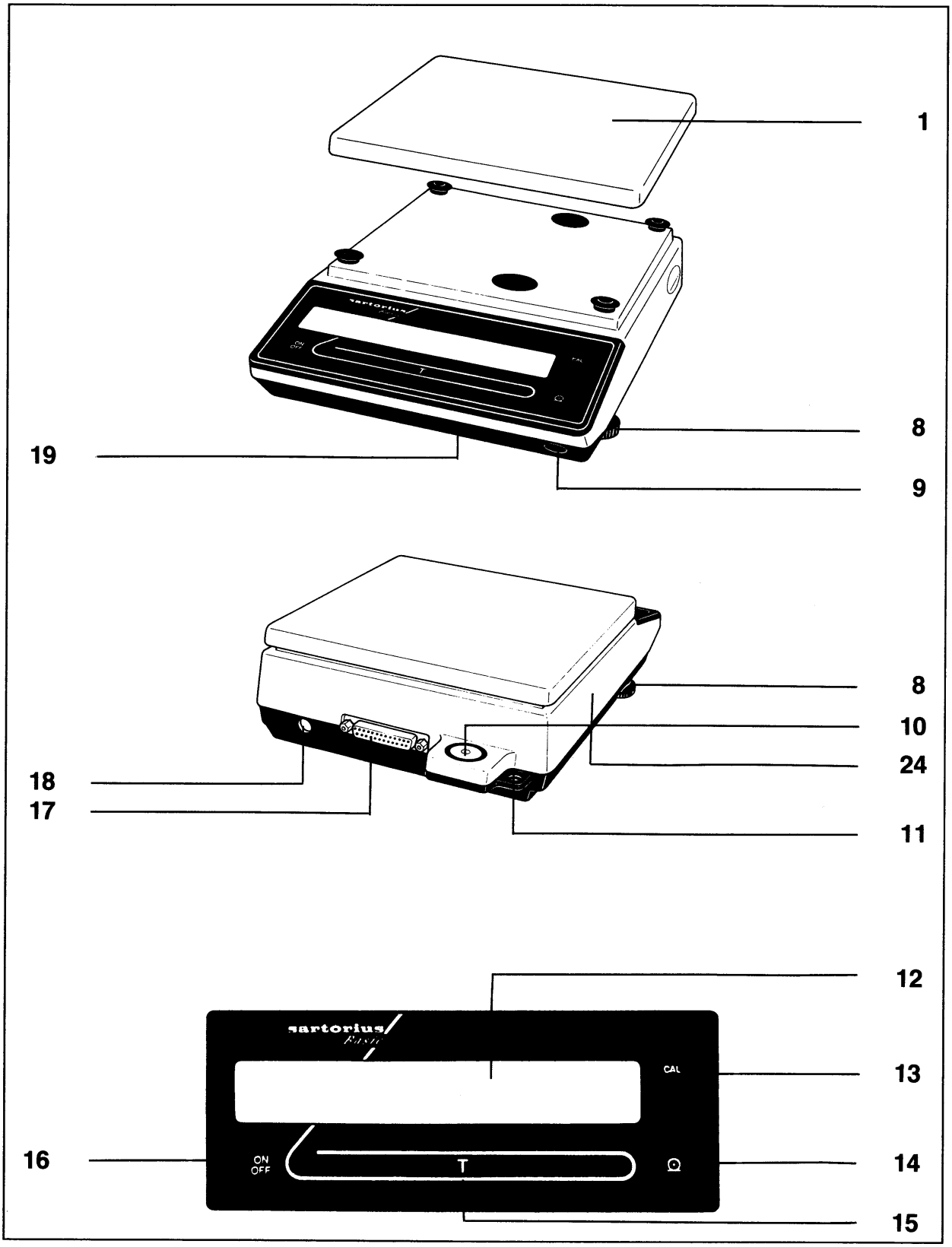
BA 210



BA 4100 S, BA 3100 P, BA 2100 S, BA 610; BA 6100, BA 4100, BA 2100



1 Weighing pan

2 Compensating ring (depends on type of model)

3 Pan support (depends on type of model)

4 Protective ring (depends on type of model)

5 Protective bushing (depends on type of model)

6 Weighing chamber base plate (depends on type of model)

7 Locking ring (depends on type of model)

8 Leveling foot (depends on type of model)

9 Menu access switch (depends on type of model)

10 Level indicator (depends on type of model)

11 Lug for attaching an antitheft locking device

12 Weight display

13 CAL key

14 Print key (for data output)

15 Tare control

16 ON/OFF key

17 Data interface

18 AC jack

19 Manufacturer's label (on bottom of balance)

20 Draft shield lid (depends on type of model)

21 Glass cylinder of the round draft shield (depends on type of model)

22 Draft shield base plate (depends on type of model)

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With this Sartorius Balance, you have acquired a high-quality electronic weighing instrument that will ease your daily work load.

Please read these installation and operating instructions carefully before operating your new balance.

Warranty

Do not miss out on the benefits of our full warranty.
Please complete the warranty registration card, indicating the date of installation, and return the card to your Sartorius dealer.

Storage and Shipping Conditions

Allowable storage temperature:	-40 °C ...+70 °C
	-40°F ...+158°F

The packaging has been designed to ensure that the balance will not be damaged even if it is dropped from a height of 80 cm maximum (about 32 inches).

Carefully unpack the balance and check the equipment immediately for any visible damage as a result of rough handling during shipment. If this is the case, proceed as directed in the section entitled "Safety Inspection."

Save all parts of the packaging and the box because you may need to ship your balance. Before packing your balance to ship it, unplug all connected cables to prevent damage.

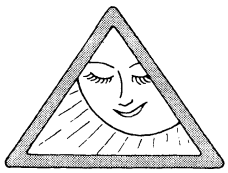
Do not expose the balance unnecessarily to extreme temperatures, moisture, shocks, blows or vibrations.

Equipment Supplied

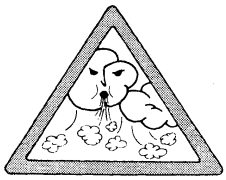
BA 210 S, BA 160 P, BA 110 S, BA 61	**BA 310 S, BA 310 P**	**BA 110,**	**BA 4100 S, BA 3100 P, BA 2100 S, BA 610, BA 210, BA 6100, BA 4100, BA 2100**
— Balance with analytical draft shield chamber	— Balance	— Balance	— Balance
— AC adapter	— AC adapter	— AC adapter	— AC adapter
— Weighing pan	— Weighing pan	— Weighing pan	— Weighing pan
— Pan support	— Pan support	— Pan support	
	— Glass cylinder of the round draft shield		
— Protective ring	— Draft shield lid	— Protective ring	
— Draft shield base plate	— Draft shield base plate	— Draft shield base plate	
— Protective bushing		— Protective bushing	
— Locking ring			
— Compensating ring		— Compensating ring	
— Dust cover			

Installation Instructions

Ambient Conditions

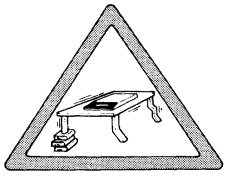


The Sartorius ***Basic*** Balance is designed to provide reliable weighing results under normal conditions in the laboratory and in industry. When choosing the area to Setup your balance, avoid exposing it to the ambient conditions listed in the following so that you will be able to work with added speed and accuracy:



- extreme heat radiation

- drafts



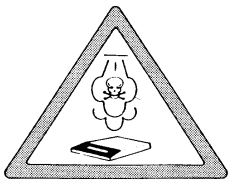
- inclined position

- extreme vibrations

- aggressive chemical atmospheres

The balance may **not** be used in a hazardous location/area where there is danger of explosion.

Do not expose the balance to extreme moisture over long periods. Moisture in the air can condense on the surfaces of the balance whenever a cold balance is brought to a substantially warmer place. If you need to transfer the balance to a warmer area, make sure to condition it for about two hours at room temperature (with the AC adapter disconnected).
Afterwards, if you keep the balance connected to power supply, the continuous positive difference in temperature between the inside of the balance and the outside will practically rule out the effects of moisture condensation.

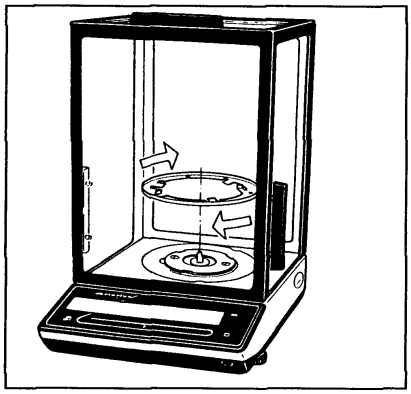


Startup

Mounting the Analytical Draft Shield Chamber on the BA 210 S, BA 160 P, BA 110 S and BA 61

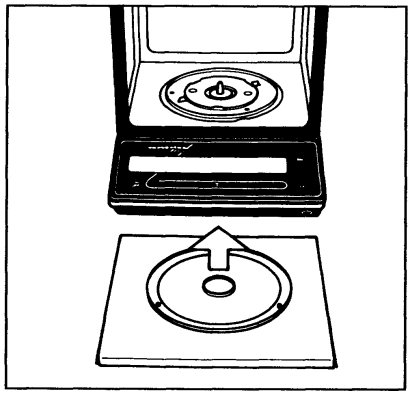
- Remove plastic, adhesive Strips and foam packaging

- When you handle the draft shield chamber, make sure it is always in an upright position



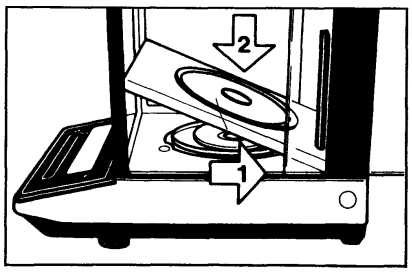
Mounting the Draft Shield

- Place the draft shield on the balance
- Take the base plate out of the weighing chamber
- Align the draft shield
- Position the locking ring **(7)** in the weighing chamber and turn it clockwise until it locks in place

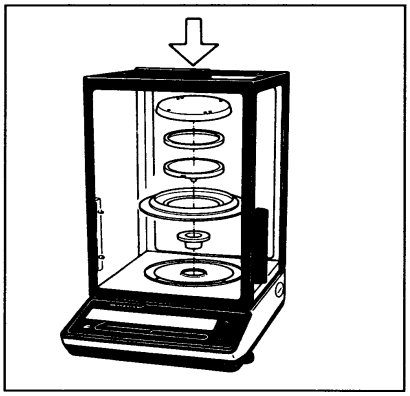


Installing the Weighing Chamber Base Plate (6)

- Position the base plate
- The rear edge of the base plate has a sealing strip

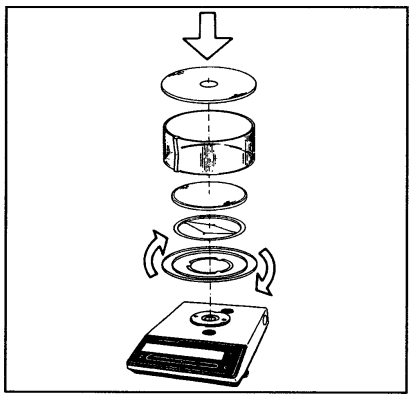


- Align the base plate with the sealing strip against the rear panel of the draft shield and then lower the front part of the base plate and press it down into place.



Installing Components in the Weighing Chamber

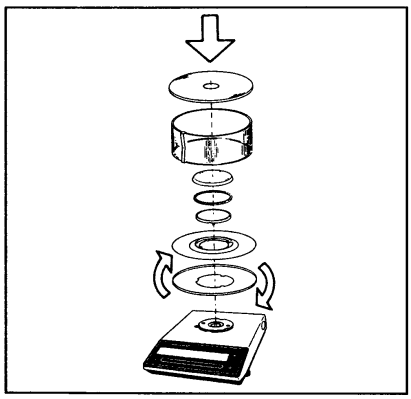
Install the components in the following order:
- protective bushing **(5)**
- protective ring **(4)**
- pan support **(3)**
- compensating ring **(2)**
- weighing pan **(1)**



Starting Up the BA 310 S and BA 310 P

- Place the draft shield base plate **(22)** on the balance and turn it clockwise until it locks in place

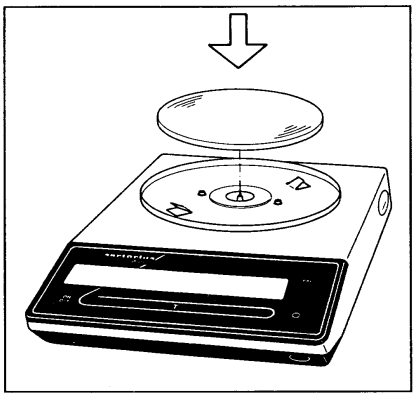
Install the following parts on the balance in this order:
- pan support **(3)**
- weighing pan **(1)**
- glass cylinder of the round draft shield **(21)**
- draft shield lid **(20)**



Starting Up the BA 110

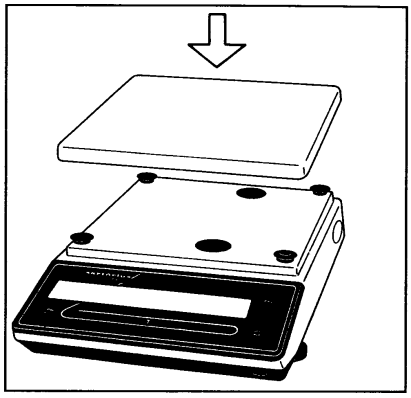
- Place the draft shield base plate **(22)** on the balance and turn it clockwise until it locks in place

Install the following parts on the balance in this order:
- - protective ring **(4)**
- - pan support **(3)**
- - compensating ring **(2)**
- - weighing pan **(1)**
- - glass cylinder of the round draft shield **(21)**
- - draft shield lid **(20)**



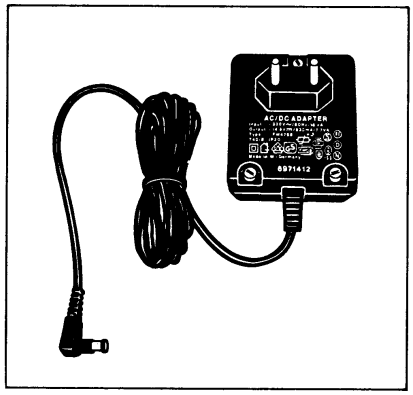
Starting Up the BA 210

Place the weighing pan **(1)** on the balance



Starting Up the BA 4100 S, BA 3100 P, BA 2100 S, BA 610, BA 6100, BA 4100 and BA 2100

Place the weighing pan **(1)** on the balance



Connecting the Balance to AC Power

Your balance is energized by an AC adapter. Make sure the voltage rating printed on this unit is identical to your local line voltage.

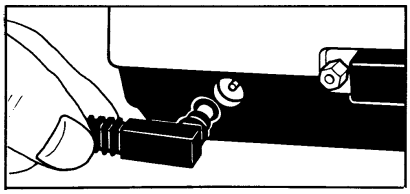
If the voltage rating specified on the AC adapter or plug design does not match the rating or Standard you use, please contact your Sartorius dealer or Office.

Important Note

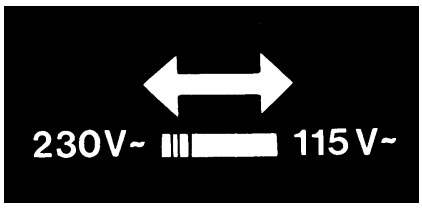
Only use original Sartorius AC adapters identified by the Sartorius label. Use of AC adapters from other manufacturers, even if these units have a registered approval rating from a national testing laboratory, requires the consent of a certified Sartorius technician.

For information about operating the balance with an external battery pack, see the section entitled "Accessories."

Detailed information on additional options for powering the balance is available in our Service Information Bulletin, no. 15/88 (for example, using local extra-low voltage).



Plug the cord of the AC adapter into the jack on the balance. Now plug the AC adapter into a wall outlet.

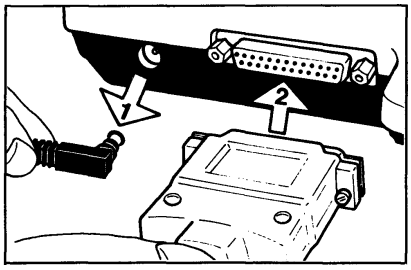


Voltage Selection
You can select the voltage only if you use our portable power supply (69 71172) that has a European-type plug (rounded prongs).

Safety Precautions

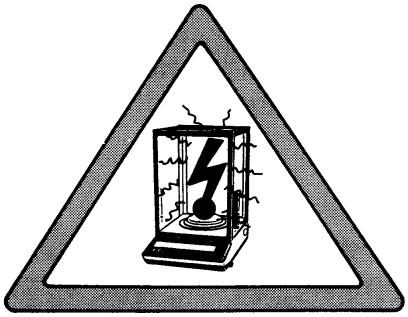
The power supply or AC adapter rated to Class 2 can be plugged into a wall outlet without taking any additional safety precautions.
The pole of the output voltage is connected to the balance housing which can be grounded for Operation.

The interface is also electrically connected to the balance housing (ground).



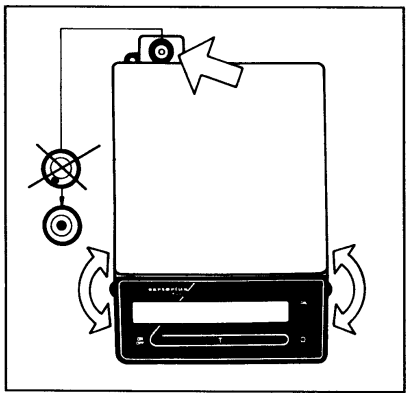
Connecting Electronic Devices (Peripherals)

Make sure to unplug the AC adapter from the wall outlet before you connect or disconnect additional devices (printer or PC) to or from the balance interface port.



Information on Weighing Electro statically Charged Samples

If you are using a balance with a 0.1 mg readability and electro statically charged glass or plastic Containers with a diameter larger than the weighing pan, you should utilize our antistatic pan (Ø 130 mm - see "Accessories") instead of the Standard weighing pan.

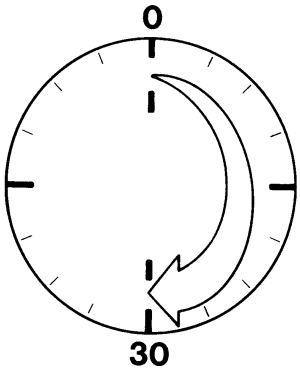


Leveling the Balance Using the Level Indicator (depends on type of model)

At the point of use, level the balance using the leveling feet **(8)** so that the air bubble is centered within the circle of the level indicator **(10)**.

To raise the balance, lower the leveling feet (turn clockwise).
To lower the balance, raise the feet (turn counter-clockwise).

How to Operate the Balance



After you have initially plugged your balance into a wall outlet (or after a relatively long power outage), allow for at least 30 minutes' warmup

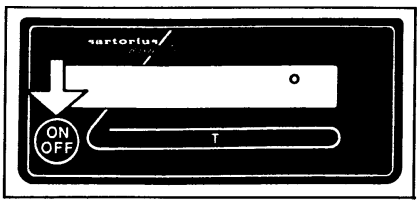
The weight display shows the following messages for your information:

○ **(OFF)**
The balance was disconnected from AC power (power failure or outage for longer than approx 3 seconds, reconnection to AC power after the balance was unplugged).

⏻ **(Standby**
The display has been turned off with the ON/OFF key **(16)** and the balance is now in the ready-to-operate mode so that it does not require warmup.

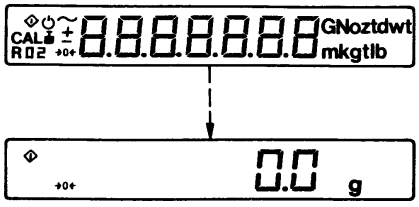
⏼ **(Busy)**
After the balance is turned on, the ⏼ symbol is displayed until you press a key for the first time. During Operation: The processor is still busy processing a function and will not accept any other command to perform functions at this time.

Weighing



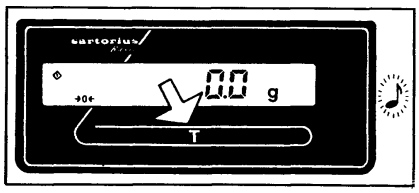
Turning the Display On and Off (Standby Mode)

Press the **ON/OFF** key **(16)** to turn the display on or off.



Self-Test

After the balance is turned on, an automatic self-test of the scale's electronic circuitry is performed.
This self-test ends with the readout "0.0 g/0.00 g/0.000 g or 0.0000 g" depending on the balance model.



Taring

For exact weight determination, press the tare control **(15)** to zero the weight display. You can tare within the entire weighing range of the balance.

Weight Determination

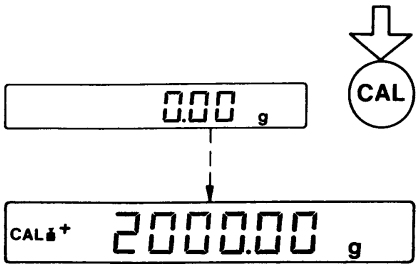
Place your sample or obJect on the weighing pan **(1)**.
Read off the weight indicated in the display **(12)** only after the weight unit ("g" or another unit if selected - see the chapter entitied "Balance Operating Menü") appears as the stability symbol.

Calibration

During calibration, the balance is adapted to changes in ambient conditions.

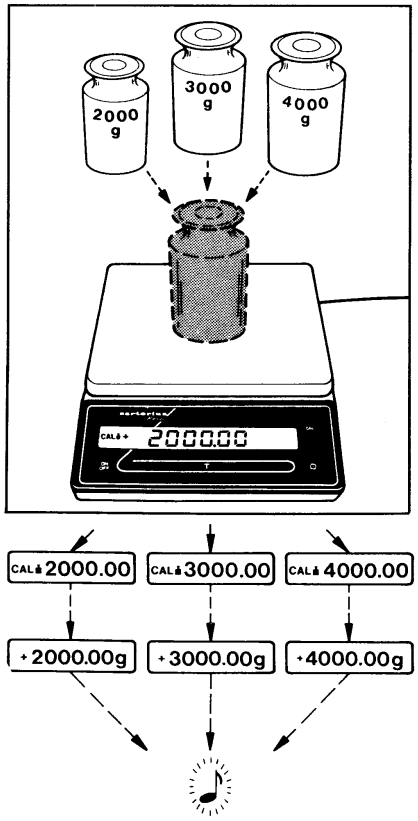
Calibrate your new balance at the point of use – after warmup and before the first measurement.
Recalibrate your balance each time you move it to a different location and whenever ambient conditions (especially the temperature) change considerably.

Unload the weighing pan and tare.



When you obtain a zero readout, press the CAL key **(13)**. The calibration routine is started and the calibration weight in grams is displayed.

If external influences are affecting the calibration, **"Err 02"** may appear briefly. In this case, tare the balance and press the CAL key again once you obtain a zero readout.



Center the calibration weight on the weighing pan.
The balance calibrates itself automatically – an acoustic signal indicates completion of the calibration procedure.

The balance can also be calibrated using other weights. See "Specifications" for a list of other calibration weights that are approved for use with your balance.

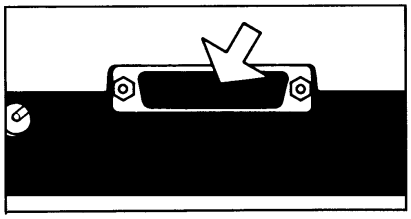
Only use calibration weights with tolerances that are equal to or better than the readability of your particular balance (see "Accessories" for information on calibration weights).

Another weight is accepted for calibration if its exact weight briefly appears in the display.

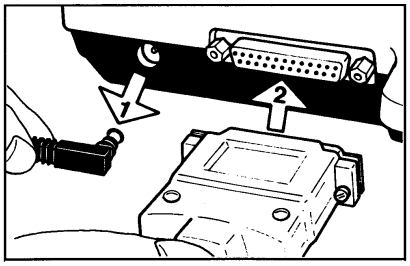
An acoustic Signal indicates completion of the calibration procedure.

Data Interface

If you wish to document your weighing data with the Sartorius Data Printer, connect the printer's interface connector to the interface port (17) on the balance. You do not need to change any settings!

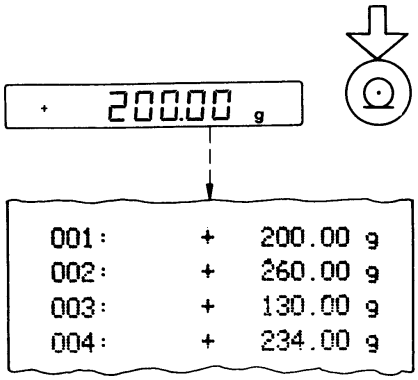


To do this, remove the protective cap from the data interface port.



- Plug the interface connector into the interface port
- Secure the interface connector by tightening the screws

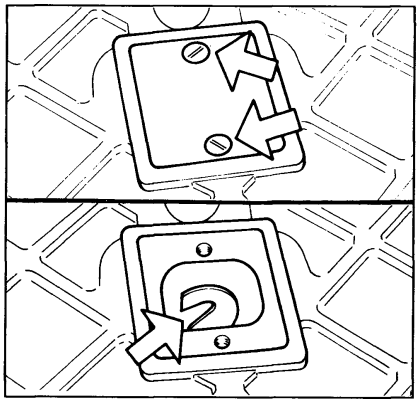
Important Note
Make sure to unplug the AC adapter from the wall outlet before you connect or disconnect additional devices (printer or PC) to or from the balance interface port.



Press the ⊙ key **(14)** for data output.

See page 24 for information on data output parameters and data ID codes. For more information about the data interface (e.g. data output and input formats, pin assignment, etc.), see the enclosed "Interface Description."

Below-Balance Weighing



A port for below-balance weighing is available on the bottom of the balance (not on models BA 160 P, BA110 S, BA61, BA110, BA 210 or BA 2100).

To fasten an attachment or hanger, open the below-balance port by removing the two screws on the bottom of the balance and detach the closing plate.

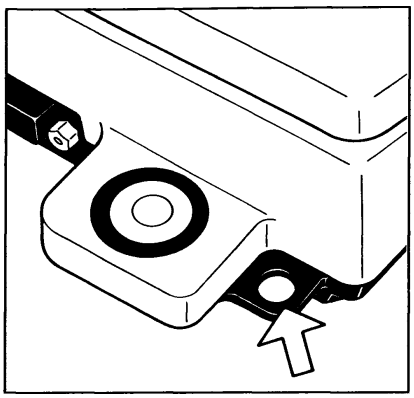
Now you can attach a sample using a Suspension wire, for example.

Common applications for below-balance weighing include specific gravity determination or immersing a sample in a special atmosphere (medium for a reaction).

Important Note

When you use such below-balance weighing attachments, you must install a shield to eliminate drafts.

How to Fasten an Antitheft Locking Device



To fasten an antitheft locking device, use the lug **(11)** located on the rear panel of the balance.

Balance Operating Menu

The balance operating menu enables you to adapt the balance to your requirements.
At the factory, we have set the codes for the balance operating program so that you normally will not need to make any changes. If you have special operating conditions, change the codes in the balance operating program to meet your individual requirements.

The **factory settings** in the balance operating program are marked with "*". Functions not marked by "*" can be set by entering the corresponding code (see page 26).
If you need to change the factory settings, make sure to record the date.

Weighing Mode:

Adaptation to Ambient Conditions

The balance is adapted to ambient conditions by changing the time allowed for weighings (see the Product Data Sheet).

	Code	Changes
Very stable environment (shortest measuring time)	1 1 1	*
Stable environment (short measuring time)	1 1 2	*
Unstable environment (long measuring time)	1 1 3	
Very unstable environment (longest measuring time)	1 2 4	

Stability Range

The stability symbol remains displayed for a weight deviation ±	Code	Changes
0,25 digit	1 3 1	
0,5 digit	1 3 2	
1 digit	1 3 3	*
2 digits	1 3 4	*
4 digits	1 3 5	
8 digits	1 3 6	

Tare Parameters

The tare function is performed:

	Code	Changes
Without stability control	1 5 1	
At stability	1 5 2	*

Auto Zero Function

When this function is activated, any zero point is eliminated so that a true zero indication is maintained.

	Code	Changes
Auto-Zero on	1 6 1	*
Auto-Zero off	1 6 2	

* = factory setting, depends on balance model in some cases

Weight Units
You can select any of the following weight units:

	Symbol	Code	Changes
Grams	g	1 7 2	*
Kilograms	kg	1 7 3	
Carats	ct	1 7 4	
Pounds	lb	1 7 5	
Ounces	oz	1 7 6	
Troy ounces	ozt	1 7 7	
Hong Kong taels	tl	1 7 8	
Singapore taels	tl	1 7 9	
Taiwanese taels	tl	1 7 10	
Grains	GN	1 7 11	
Pennyweights	dwt	1 7 12	
Milligrams	mg	1 7 13	
Parts per pound	o	1 7 14	
Chinese taels	tl	1 7 15	
Mommes	m	1 7 16	
Austrian carats	k	1 7 17	
Tola	t	1 7 18	
Baht	b	1 7 19	
Mesghal	m	1 7 20	

Some unit symbols printed on hard copy or output on a computer screen will differ from the way they are shown on the balance display:

this applies to code numbers ending with

8=	tlh
9=	tls
10=	tlt
14=	/lb
15=	tlc
16=	mom
17=	K
18=	tol
19=	bat
20=	MS

Calibration Function

	Code	Changes
Calibration with standard calibration weight only	1 9 1	
Calibration with standard or other calibration weights approved for use	1 9 2	*
Calibration function – access denied	1 9 5	

Final Readout Mode »--«

If you are only interested in the final readout, you can select this mode with code 2 5 1. A special symbol " - -" is displayed until the final stable readout appears in digits. For the standard readout mode, set code 2 5 2 (all readouts in digits).

Read out »--«	Code	Changes
Special symbol»--« for unstable readouts when load changes	2 5 1	
Standard digital readout mode	2 5 2	*

* = factory setting, depends on balance model in some cases

Additional functions:

Beep Tone (Acoustic Signal)

If you desire, you can turn off the beep tone – also called an acoustic signal.

Acoustic signal	Code	Changes
ON	8 2 1	*
OFF	8 2 2	

Universal Switch

An external switch can be connected via the interface port – you can change the setting in the menu code to alter the function of this switch

Funktionen	Code	Changes
Print	8 4 1	*
Tare	8 4 2	

Power-On Mode

Depending on the your operating requirements, you can change the power-on mode of your balance.

If you define the code for "toggle between on and off," the balance power will remain turned off after a power failure has occurred or after you have temporarily disconnected your balance from AC current. After the balance is turned off, power is not available for the "standby" mode. Use the ON/OFF key **(16)** to turn the balance on or off.

In the setting "toggle between on and standby", the balance power is turned on automatically after a power failure has occurred or after you have disconnected your balance temporarily from AC power.

In the setting "automatic power-on," the balance will automatically turn on again after a power failure has occurred, the balance has been disconnected from AC power, or after you have pressed the ON/OFF key **(16)**. In this setting, the balance can no longer be turned off by the ON/OFF key.

Power-on mode	Code	Changes
(Power) off → on ←→ standby	8 6 1	*
on ←→ (Power) off	8 6 2	
on ←→ standby	8 6 3	
Automatic power-on	8 6 4	

Automatic Shutoff (functions only if the menu code 8 6 2 is selected or if the balance is powered by the rechargeable battery pack)

If you operate the balance with a battery pack, set the menu code for the "Automatic Shutoff" function in order to save energy and thereby increase the service life of the battery. If the weight shown in the display does not change for 2 minutes, the display will show " ⏀ ". After another 2 minutes, the balance turns itself off automatically.

Automatic Shutoff	Code	Changes
ON	8 7 1	
OFF	8 7 2	*

* = factory setting, depends on balance model in some cases

Utilities for Printouts or Data Transfer:

Sartorius Balances come Standard with an interface.
You can plug a Sartorius Printer or a Computer into this interface port to print data on hard copy or transfer them to your Computer. Moreover, you can choose to Output data from your balance to this on-line device either automatically or by pressing the print key on the balance.
The balance operating menu lets you define the various parameters for data Output.
For information on the data formats and for interfacing a Computer or a different peripheral device, see "Interface Description."

Data Output Parameter

This parameter is coupled with or without the stability parameter = stable readout or no motion is detected
Print on request = data is Output only when the print key is pressed or a Software command is received
Auto print = continuous, automatic data output

	Code	Changes
Print on request regardless of stability	6 1 1	
Print on request after stability with storage of the function	6 1 2	*
Print on request after stability without storage of the function	6 1 3	
Auto print regardless of stability	6 1 4	
Auto print at stability	6 1 5	

Data Output in Defined Intervals

You can reduce the volume of data in the "auto print" mode by defining the interval at which data will be Output automatically. This auto print interval is based on the number of times the display is updated.

Auto print interval	Code	Changes
1 display update	6 3 1	*
2 display updates	6 3 2	

Data ID Codes

An **"N"** printed or displayed before a weight identifies it as a net weight.
This ID code increases the data output format for each value from 16 to 22 characters.

ID code for data output	Code	Changes
Without	7 2 1	*
With	7 2 2	

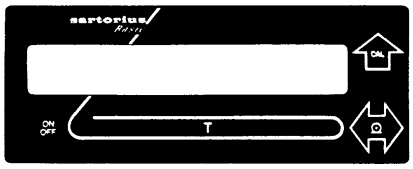
* = factory setting, depends on balance model in some cases

Changing Settings in the Balance Operating Menu

Select the appropriate code to change settings for certain functions.

There are three Steps to changing a code:

- access the menu
- set the code
- confirm and store this code



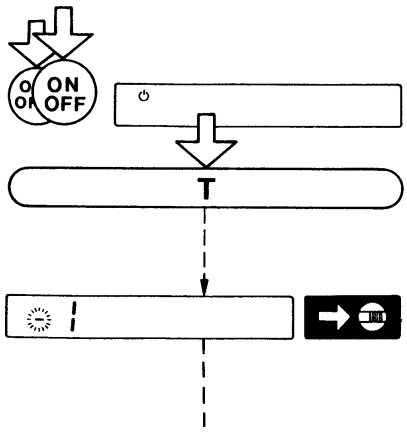
The following keys have special functions when setting a code:

CAL (13) = in crease displayed digit (once you have run through all numbers, the series will start again from "0")

T (15) = confirm settings, store them and exit the menu

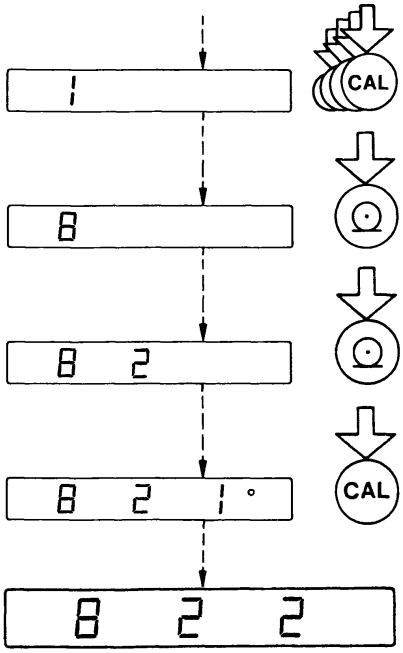
(14) = move to the right and left

Now please try it for yourself - turn off the beeper tone (acoustic Signal) - code: **8 2 2**.



How to Access the Menu

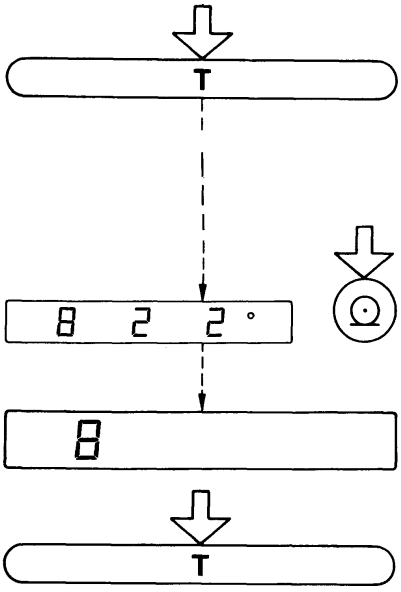
- Turn off the balance
- Hold down the tare key **(15)** and briefly press the ON/OFF key **(16)**
- Release the tare key once " | " appears in the display
- When the display shows "**—**" in front of the left number, remove the protective cap located on the front right of the balance and move the menu access switch **(9)** in the direction of the arrow



- press the **CAL** key until **"8"** appears

- press the ⊙ key until the third digit of the code appears (here, the current code setting always appears)

- use the **CAL** key to change the right-hand number to **"2"**



- confirm the code setting You must press the tare control **(15)** to confirm the code you have just set (this is indicated by **"o"** after the code).

- use the ⊙ key to move to the left digit

- press the tare control (15) to store the menu code setting

Important Note
The changed code will not be stored if you turn off the balance with the ON/OFF key during the setting procedure, or before storing the menu code.

In the balance operating program, each code setting is indicated by **"o"** behind the last number. When you access the menu of the balance operating program and move to the right-hand number, the current code setting is displayed. This makes it easy to check the codes you have set.

How to Undo All Menu Code Changes: Reset Function

The reset function lets you undo all menu code changes, which means you obtain the menu codes originally set at the factory (marked by “*”) so your balance will operate according to them.

To use this function, set code **9 - - 1^{o}.** Confirm and store this entry as described on page 27.

Troubleshooting Guide

Problem ...	Causes ...	Remedy
No segments appear in the weight display **(12)**?	- No AC power available - The AC adapter is not plugged in	- Check AC power supply - Plug in AC adapter
The weight display shows **"H"**?	- Sample exceeds the capacity of the balance	- Unload the balance
Weight display shows **"L"** or **"Err 54"**?	- The weighing pan **(1)** , pan support **(3)** and/or compensating ring **(2)** are not in place	- Install weighing pan, pan support (depends on type of model) and compensating ring (depends on model)
Weight display briefly displays **"Err 02"**?	- The CAL key **(13)** was not pressed when the display indicated zero - The balance is loaded	- Press the tare control and re-press the CAL key - Unload the balance
The special message " ⏼ " does not go out in the weight display	- No key has been pressed since the balance was turned on	- Press any key
The weight readout changes constantly	- Unstable ambient conditions - Too much Vibration or the balance is exposed to a draft - The draft shield is not completely closed - A foreign object is caught between the pan and the balance housing - The port for the below-balance weighing attachment is uncovered - The sample does not have a stable weight (absorbs moisture or evaporates)	- Set up the balance in another area - Access the menu to adapt the balance to the particular weighing environment - Close the draft shield - Remove foreign object - Fasten the closing plate to dose the port for below-balance weighing
The display shows **"Lo Accu"** or a weight flashes in the display?	- The battery voltage is too low	- Connect balance or external battery pack to line power using the AC adapter
The weight readout is obviously wrong	- The balance is not calibrated - The balance was not tared before weighing - The air bubble in the level indicator **(10)** is not within the circle	- Calibrate (see p. 19) - Tare before weighing - Level the balance (see p. 16)

Care and Maintenance

Cleaning

Before cleaning the balance, unplug the AC adapter from the wall outlet.

Please do no use any aggressive cleaning agents (solvents or similar agents). Instead, use a piece of cloth wet with a mild detergent.
Make sure that no liquid enters the balance housing.
After cleaning, wipe down the balance with a soft, dry piece of cloth.

Safety Inspection

If there is any indication that safe Operation of the balance with the AC adapter is no longer warranted, turn off the power and unplug the balance from AC power. Lock the balance and AC adapter in a secure place to ensure that they cannot be used for the time being.

Safe Operation of the balance with the AC adapter is no longer ensured when

- there is visible damage to the AC adapter
- the AC adapter no longer functions properly
- the AC adapter has been stored for relatively long periods under unfavorable conditions

In this case, notify your nearest Sartorius Service Center or the International Service Support Department in Goettingen, Germany. Only service technicians who have access to the required maintenance manuals are allowed to perform maintenance and repair work on the equipment.

We recommend the balance along with the AC adapter be inspected according to the following checklist by a qualified Sartorius service technician:

- Leakage current < 0.05 mA measured by a properly calibrated multimeter
- Insulation resistance > 7 megohms measured with a constant voltage of at least 500V at a 500 kohm load

The duration and number of measurements should be determined by a qualified Sartorius service technician according to the particular ambient and operational conditions for the AC adapter. However, such inspections should be done at least once a year,

Pursuant to the German Directive for the Implementation of Regulations for Prevention of Accidents "Elektrische Anlagen und Betriebsmittel (VBG 4)" [Electrical Installations and Equipment] of April 1986, in conjunction with Article 10 of the Low Voltage Directive 73/23/EEC issued on February 19, 1973, by the European Community, it is hereby certified that the equipment delivered, "Electronic Analytical or Precision Balance of the Basic Series" is manufactured and tested in compliance with the following DIN/VDE regulations

DIN IEC 348/VDE 0411
Safety requirements for electronic measuring apparatus

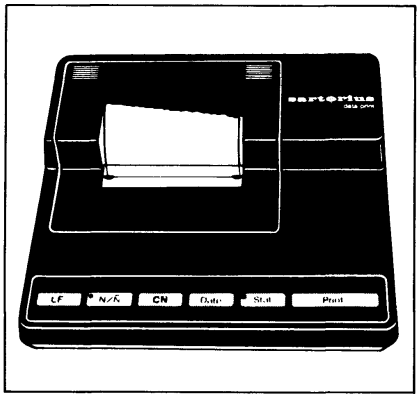
DIN IEC 380/VDE 0806
Safety of electrically energized office machines

DIN IEC 601 /VDE 0750
Safety of medical electrical equipment

When you use electrical equipment in installations and under ambient conditions requiring higher safety Standards, you must comply with the provisions as specified in the applicable regulations for installation in your country.

The electrical and electronic components used in the balance are rated at least Class KSF according to DIN 40040.

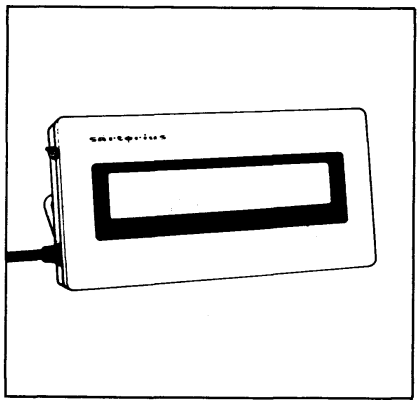
Accessories (Options)



Data printer **YDP 02-0DV1**
with date/time and statistics functions

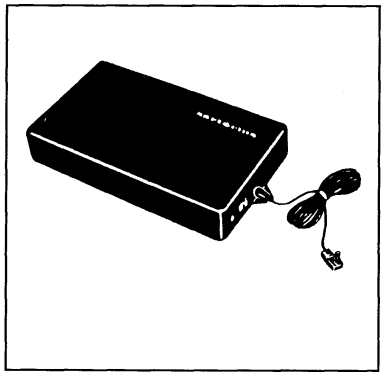
Print speed approx. lines/sec. 1,5

Printer housing (B x T x H)
in mm 150 x 138 x 43



Remote display
(can be plugged into the interface port of the balance)

— LCD, reflective **737101 A**
— LCD, for overhead projectors,
transmissive **737102 A**



External Battery Pack, **YRB02Z**

can be recharged using the AC adapter (time it takes to Charge a completely discharged battery pack: 15 hrs); see "Specifications" regarding hours of Operation.

The balance automatically "recognizes" that it is being powered by a battery pack. When utilizing the battery pack, use the ON/OFF key **(16)** to turn the balance on and off (if the code 8 6 4 is set in the balance operating menu, you cannot turn the balance off using the ON/OFF key). After you turn off the balance, there is no supply of power for "Standby" Operation. The balance can also tell when it is being powered by line current, provided the AC adapter is plugged in and the line current supply is intact. If you utilize the battery pack, the code for automatic shutoff - 8 7 1 should be set to increase the time you can operate the balance before having to recharge the batteries (see page 24 in addition).

External calibration weights:

for balance model	Accuracy class (OIML)	Weight in g	Order No.
BA 61	E2	1 x 50	**YCW 4528**
BA 110 S, BA 160 P, BA 110	E2	1 x 100	**YCW 5128**
BA 210	F2	1 x 100	**YCW 5148**
BA 210 S	E2	1 x 200	**YCW 5228**
BA 310 P, BA 310 S	F1	1 x 200	**YCW 5238**
BA 610	F2	1 x 500	**YCW 5548**
BA 3100 P	F1	1 x 1000	**YCW 6138**
BA 2100	F2	1 x 1000	**YCW 6148**
BA 2100 S, BA 4100 S, BA 4100	F1	1 x 2000	**YCW 6238**
BA 6100	F1	1 x 5000	**YCW 6538**

"Balance Reader" applications kit including Software **YAK 10 PC-0002**
for collecting data that are transmitted by your Sartorius Balance/Scale to a commercially available personal Computer. These data are read into spreadsheets and stored. The stored spreadsheets can be further processed using Standard Software available on the market (Excel, Lotus 1 -2-3, etc.).
This applications kit includes the following Software and equipment:
— 3 ½" and 5¼" program diskettes
— program description
— interface cable
— adapter (25-position to 9-position)

Specific gravity determination set for BA 210 S, BA 160 P and BA 110 S **YDK 01**

Antistatic weighing pan for balances with 0.1 mg readability **YWP 01 BA**

Analytical draft shield chamber for the BA 310 P and BA 310 S **YDS 03**

Universal remote control switches
with menu code definable print or tare functions:

Foot switch	**7223**
Foot switch with T-Connector	**YPE 01 Z**
Hand switch	**7226**
T-Connector	**7258**

Dust cover

— for balance with round weighing pan	**YDC 01 BA**
— for balance with rectangular weighing pan	**YDC 02 BA**

Carrying case

— for balances with an analytical draft shield	**YDB 01 BA**
— for balances without an analytical draft shield	**YDB 02 BA**

Specifications

Model		**BA 210 S**	**BA 160 P**	**BA 110 S**	**BA 61**
Weighing range structure		SuperRange	PolyRange	SuperRange	
Weighing range/capacity	g	210	30/60/110/160	110	61
Readability	mg	0,0001	0,0001/0,0002/ 0,0005/0,001	0,0001	0,0001
Tare range (by subtraction)	g	-210	-160	-110	-61
Reproducibility (standard deviation)	g	≤±0,0001	≤±0,0001/0,0002/ 0,0005/0,001	≤±0,0001	≤±0,0001
Linearity	g	≤±0,0002	≤±0,0002/0,0002/ 0,0005/0,001	≤±0,0002	≤±0,0002
Response time (typical)	g	≤ 2,5	≤ 2	≤ 2	≤ 2
Adaption to ambient conditions and application requirements		← by selection of 1 of 4 optimized filter levels →			
Display update (depends on the filter level selected	s	← 0,1 – 0,4 (selectable) →			
Allowable ambient temperature range	°C	← +5 .. +40 →			
Operating temperature range	°C	← +10 ... +30 →			
Sensitivity drift within +10 ... +30°C	/C°	≤±2 · 10^{-6}	≤±3 · 10^{-6}	≤±2 · 10^{-6}	≤±2 · 10^{-6}
Moisture-proof rating according to DIN 40 040		← Class F, non-condensing →			
Pan size	mm	← Ø 80 →			
Wägeraumhöhe	mm	← 200 →			
Net weight, approx.	kg	← 5,5 →			
Selectable weight units		g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, mg, /lb, tlc, mom, K, tol, bat, MS			
Automatic zero tracking function (can be turned off by menu code)		← standard feature →			
Standard calibration weight (min. accuracy class)	g	200 (E2)	100 (E2)	100 (E2)	50 (E2)
Other permissible calibration weight (min. accuracy class)	g	100, 100+50 (E2)	50, 100+50 (E2)	50 (E2)	- - -
AC power source/ power requirements	V~	← via AC adapter, 230 or 115, -20% ... +15% →			
Frequency	Hz	← 48 – 60 →			
Power consumption, (typical)	VA	← maximal 16; typical 8 →			
Hours of operation with a fully-charged YRB 02 Z external battery pack	h	← 48 →			
Built-in interface		RS 232 C-S/V24-V28; 7-bit; -even, -odd; transmission rates 150 … 19200 Baud, 1 or 2 stopbits, software/Hardware handshake			

Specifications

Model		BA 310 S	BA 310 P	BA 110
Weighing range structure		SuperRange	PolyRange	
Weighing range/capacity	g	310	60/120/310	110
Readability	mg	0,001	0,001/0,002/0,005	0,0001
Tare range (by subtraction)	g	-310	-310	-110
Reproducibility (standard deviation)	g	≤±0,001	≤±0,001/0,001/0,003	≤±0,001
Linearity	g	≤±0,002	≤±0,002/0,002/0,005	≤±0,001
Response time (typical)	g	≤ 1,5	≤ 1,5	≤ 2
Adaption to ambient conditions and application requirements		← by selection of 1 of 4 optimized filter levels →		
Display update (depends on the filter level selected	s	← 0,1 – 0,4 (selectable) →		
Allowable ambient temperature range	°C	0 ... +40	0 ... +40	+5 ... +40
Operating temperature range	°C	← +10 ... +30 →		
Sensitivity drift within +10 ... +30°C	/C°	$\leq \pm 2 \cdot 10^{-6}$	$\leq \pm 5 \cdot 10^{-6}$	$\leq \pm 2 \cdot 10^{-6}$
Moisture-proof rating according to DIN 40 040		← Class F, non-condensing →		
Pan size	mm	Ø 130	Ø 130	Ø 80
Net weight, approx.	kg	4,5	4,5	3,5
Selectable weight units		g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, mg, /lb, tlc, mom, K, tol, bat, MS		
Automatic zero tracking function (can be turned off by menu code)		← standard feature →		
Standard calibration weight (min. accuracy class)	g	200 (F1)	200 (F1)	100 (F1)
Other permissible calibration weight (min. accuracy class)	g	100+50, 200+50, 200+100 (F1)	100, 100+50, 200+50, 200+100 (F1)	50 (F1)
AC power source/ power requirements	V~	← via AC adapter, 230 or 115, -20% ... +15% →		
Frequency	Hz	← 48 – 60 →		
Power consumption, (typical)	VA	← maximal 16; typical 8 →		
Hours of operation with a fully-charged YRB 02 Z external battery pack	h	← 48 →		
Built-in interface		RS 232 C-S/V24-V28; 7-bit; -even, -odd; transmission rates 150 … 19200 Baud, 1 or 2 stopbits, software/Hardware handshake		

Specifications

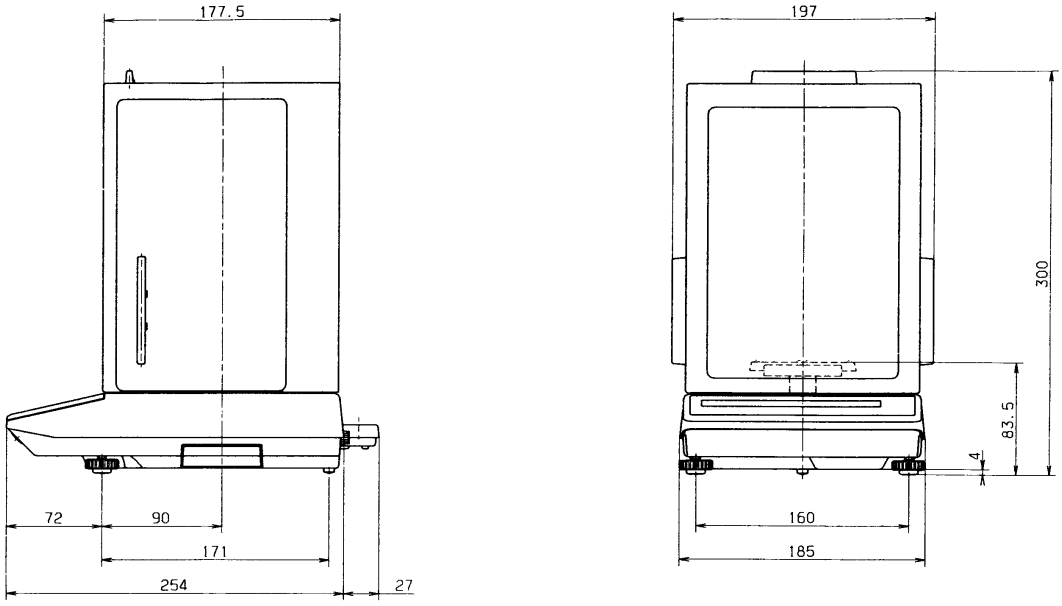
Model		BA 4100 S	BA 3100 P	BA 2100 S	BA 610
Weighing range structure		SuperRange	PolyRange	SuperRange	
Weighing range/capacity	g	4100	600/1200/3100	2100	610
Readability	mg	0,01	0,01/0,02/0,05	0,01	0,01
Tare range (by subtraction)	g	-4100	-3100	-2100	-610
Reproducibility (standard deviation)	g	≤±0,01	≤±0,01/0,01/0,03	≤±0,01	≤±0,005
Linearity	g	≤±0,02	≤±0,02/0,02/0,05	≤±0,02	≤±0,01
Response time (typical)	g	≤ 1,5	≤ 1,5	≤ 1,5	≤ 1
Adaption to ambient conditions and application requirements		← by selection of 1 of 4 optimized filter levels →			
Display update (depends on the filter level selected	s	0,1 – 0,4	0,1 – 0,4	0,1 – 0,4	0,1 – 0,6
Allowable ambient temperature range	°C	← 0 .. +40 →			
Operating temperature range	°C	← 0 ... +40 →			
Sensitivity drift within +10 ... +30°C	/C°	≤±2 · 10^{-6}	≤±5 · 10^{-6}	≤±2 · 10^{-6}	≤±5 · 10^{-6}
Moisture-proof rating according to DIN 40 040		← Class F, non-condensing →			
Pan size	mm	← 175 x 175 →			
Net weight, approx.	kg	3,9	3	3	3
Selectable weight units		g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, mg, /lb, tlc, mom, K, tol, bat, MS			
Automatic zero tracking function (can be turned off by menu code)		← standard feature →			
Standard calibration weight (min. accuracy class)	g	2000 (F1)	1000 (F1)	2000 (F1)	500 (F2)
Other permissible calibration weight (min. accuracy class)	g	2000+100 2000+2000 (F1)	2000, 2000+1000 (F1)	1000, 1000+500 (F1)	200+100, 200+200, 500+100 (F2)
AC power source/ power requirements	V~	← via AC adapter, 230 or 115, -20% ... +15% →			
Frequency	Hz	← 48 – 60 →			
Power consumption, (typical)	VA	← maximal 16; typical 8 →			
Hours of operation with a fully-charged YRB 02 Z external battery pack	h	← 48 →			
Built-in interface		RS 232 C-S/V24-V28; 7-bit; -even, -odd; transmission rates 150 … 19200 Baud, 1 or 2 stopbits, software/Hardware handshake			

Specifications

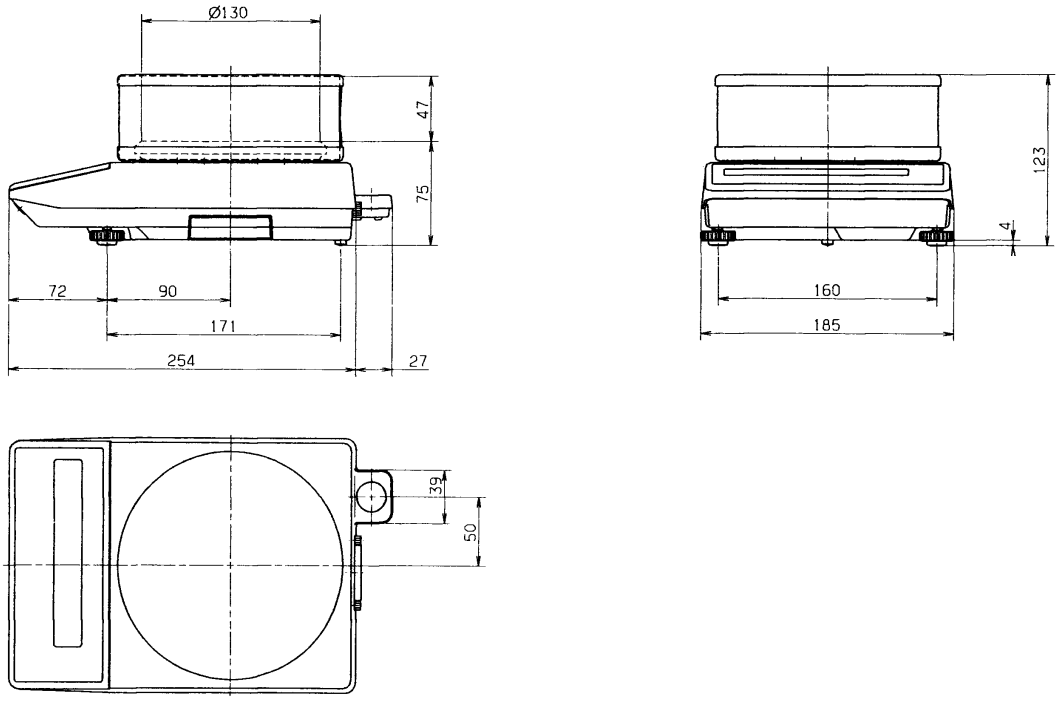
Model		BA 210	BA 6100	BA 4100	BA 2100
Weighing range/capacity	g	210	6100	4100	2100
Weighing range/capacity	mg	0,01	0,1	0,1	0,1
Tare range (by subtraction)	g	-210	-6100	-4100	-2100
Reproducibility (standard deviation)	g	≤±0,005	≤±0,05	≤±0,05	≤±0,05
Linearity	g	≤±0,01	≤±0,1	≤±0,1	≤±0,1
Response time (typical)	g	← ≤ 1 →			
Adaption to ambient conditions and application requirements		← by selection of 1 of 4 optimized filter levels →			
Display update (depends on the filter level selected	s	0,1 – 0,6	0,1 – 0,4	0,1 – 0,4	0,1 – 0,4
Allowable ambient temperature range	°C	← 0 .. +40 →			
Operating temperature range	°C	← 0 ... +40 →			
Sensitivity drift within +10 ... +30°C	/C°	≤±10 · 10^{-6}	≤±5 · 10^{-6}	≤±5 · 10^{-6}	≤±10 · 10^{-6}
Moisture-proof rating according to DIN 40 040		← Class F, non-condensing →			
Pan size	mm	116	175 x 175	175 x 175	175 x 175
Net weight, approx.	kg	1,6	3	3	1,6
Selectable weight units		g, kg, ct, lb, oz, ozt, tlh, tls, tlt, GN, dwt, mg, /lb, tlc, mom, K, tol, bat, MS			
Automatic zero tracking function (can be turned off by menu code)		← standard feature →			
Standard calibration weight (min. accuracy class)	g	100 (M1)	5000 (F2)	2000 (F2)	1000 (M1)
Other permissible calibration weight (min. accuracy class)	g	100+50, 200 (M1)	2000+1000, 2000+2000, 2000 (F2)	2000+1000, 2000+2000 (F2)	1000+500; 2000 (M1)
AC power source/ power requirements	V~	← via AC adapter, 230 or 115, -20% ... +15% →			
Frequency	Hz	← 48 – 60 →			
Power consumption, (typical)	VA	← maximal 16; typical 8 →			
Hours of operation with a fully-charged YRB 02 Z external battery pack	h	← 48 →			
Built-in interface		RS 232 C-S/V24-V28; 7-bit; -even, -odd; transmission rates 150 … 19200 Baud, 1 or 2 stopbits, software/Hardware handshake			

Dimensions (Scale Drawings)

BA 210 S, BA 160 P, BA 110 S, BA 61



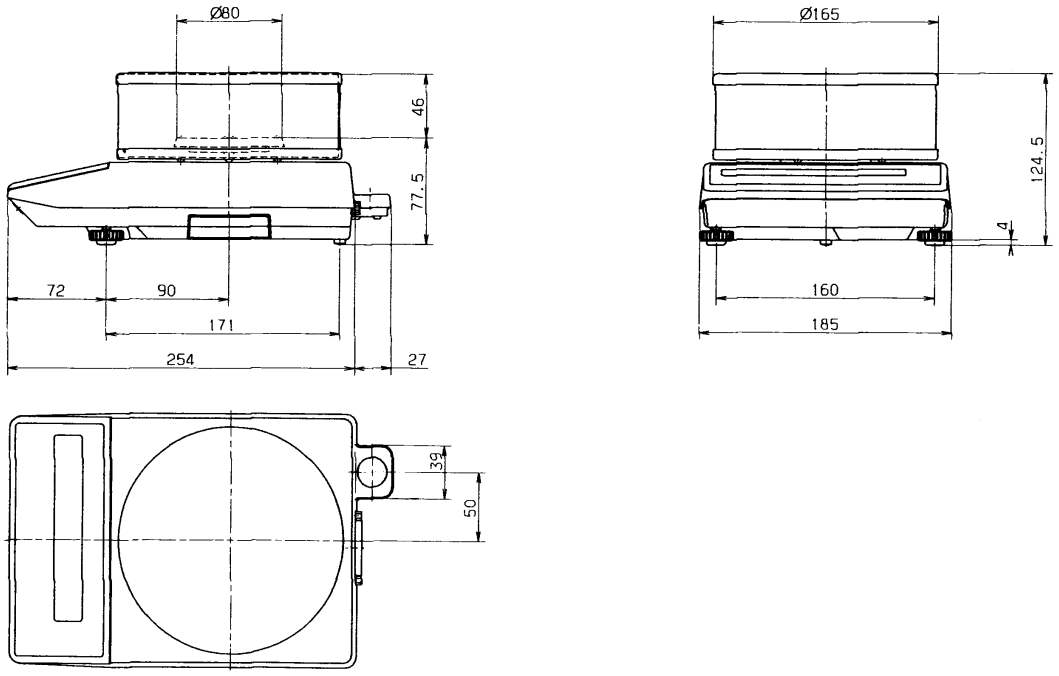
BA 310 S, BA 310 P



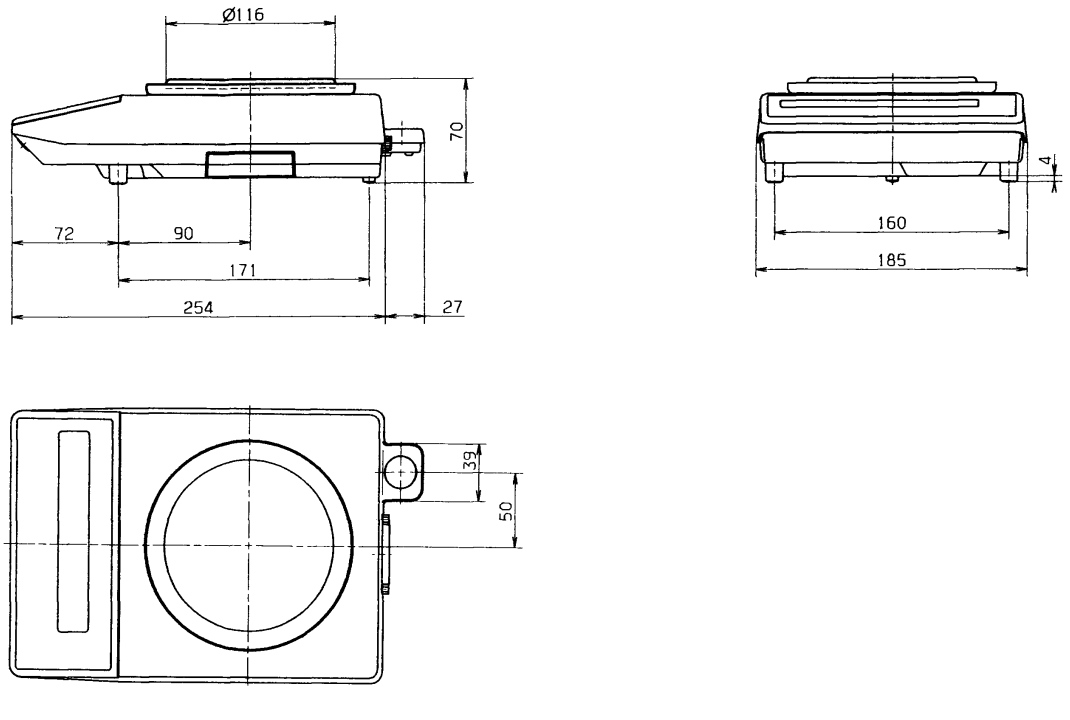
Note: All dimensions are given in millimeters.

Dimensions (Scale Drawings)

BA 110



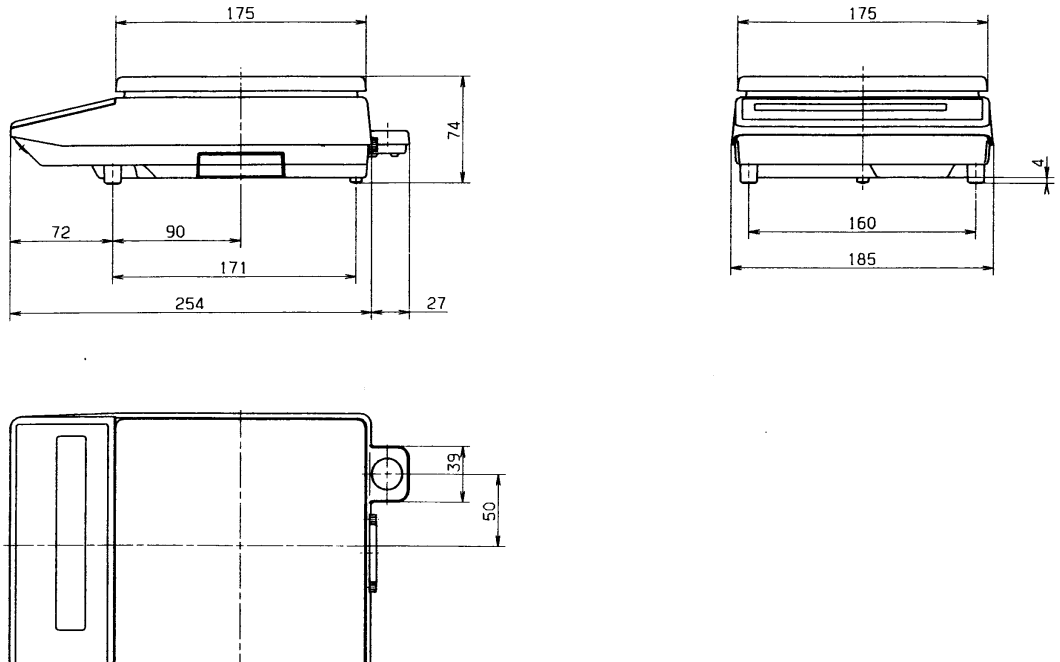
BA 210



Note: All dimensions are given in millimeters.

Dimensions (Scale Drawings)

BA 4100 S, BA 3100 P, BA 2100 S, BA 610, BA 6100, BA 4100, BA 2100



Note: All dimensions are given in millimeters.

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